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## THE EUCALYPTUS TREES OF CALIFORNIA

BY JEAN BROADHURST

While the palms of California are at first the most novel feature of the landscape to the tourists from eastern or northeastern United States, they, because of our familiarity with that type of vegetation through pictures and the struggling specimens seen in conservatories and even in parlors and roof gardens, soon become an almost unnoted part of the general impression that means California.

The above is not true of the eucalyptus trees or "eucalypts" as they are beginning to be called — and quite sensibly, too. For those who object to the English plural of cactus would refuse to try similar five-syllabled plural for eucalyptus; and even the advocates of anglicized spelling must be relieved to learn the simpler three syllabled "eucalypts" for the plural form. The eucalypts, with the erratic and unsymmetrical branching of the tall and rapidly-growing younger trees, are as striking as young ginkgo trees, though they, too, become more symmetrical as they grow older. Irregular rows of these characteristic trees border the lanes, streets, and fields; young, blue-gray groves of them cover mistily the distant slopes. Examining them more closely the usual tourist comes away with a hazy idea that the eucalyptus tree is "very easy to tell at a distance, and very difficult to identify when seen close by. The bark scales off, like the buttonwood or sycamore, or in strips like a juniper, or it doesn't come off at all. The leaves are either blue-gray, or dull green; or both kinds may be found on one tree. The leaves are broad, rounded at the tip, and sessile like the boneset; or else they are slender, falcate, and long petioled, in which case they have a wholly different position from the broader spreading leaves of the same tree, hanging down in a limp loose-jointed way like the heavy hands of an uncomfortable raw-boned youth. The eucalypts bear curious conical flower bases or fruits which are very aromatic, or they never bear any fruit at all." And so the contradictions continue until one wonders if there is anything the eucalyptus trees may or may not have and yet be eucalypt-

tus trees. Then, suddenly, some of the eucalyptus "literature" that floods the state comes that way, and the dazed traveler reads that "there are now growing in California over sixty species of *Eucalyptus*", and he is at once illuminated and satisfied until his next walk abroad; then the differences and likenesses become amazingly confused, and he sees that no tree is like any other tree, and yet every tree is like every other tree. Then, if he be a philosophical traveler, his satisfaction becomes merged into relief that *he* doesn't have to demonstrate the existence of one hundred and fifty possible species, and that, anyhow, he isn't going to stay long enough in California for people who guess his botanical taint to find out his weakness — at least if he tactfully leads them to discuss the merits and value of the eucalyptus and so away from the dangerous quicksand of eucalyptus teleology, which is just what this article proposes to do. For it is enough to have sixty or more species of any one family suddenly thrust upon the unsuspecting traveler, without having among them, species in which the "leaf" is so varied that a single tree may show leaves that are alternate or opposite, spreading or declined, and broadly elliptical or narrow and unsymmetrical.

The eucalyptus tree commonly called the "gum" tree was introduced into California for ornamental purposes in 1856. It is a native of Australia and the adjacent islands, and belongs to the family Myrtaceae, numbering over one hundred and fifty distinct species. The genus was first discovered by the French botanist, L'Heritier, in 1788, and was named by him *Eucalyptus*, meaning "well concealed," the name being prompted by the closely-covered and well-concealed flower buds. Baron von Mueller, a recognized authority on eucalyptus, suggested the general term "eucalypts" which is now in common use. In 1870 Elwood Cooper, of Santa Barbara, commenced large planting operations to test many species.

The Department of Agriculture (Bulletin No. 35 of the Bureau of Forestry) issued an extensive series of photographic plates as aids in identifying the species. Since then the state forester's office has issued a very comprehensive bulletin covering the trees

now growing in California ; and the State Agricultural Experiment Station has recently issued a detailed bulletin concerning the many species growing in the state.



FIGURE I. A good stand of *E. tereticornis* trees, fourteen months old.\*

The common species in California are *Eucalyptus botryoides*, bastard mahogany ; *E. citriodora*, lemon gum ; *E. corynocalyx*,

\* Plate loaned by the Eucalyptus Timber Company, Los Angeles, California ; the same company also furnished numerous pamphlets from which were gathered most of the data in this article.

sugar gum ; *E. crebra*, narrow leafed ironbark or gray gum ; *E. diversicolor*, Karri ; *E. globulus*, blue gum ; *E. pilularis*, blackbutt ; *E. punctata*, leather jacket ; *E. resinifera*, mahogany, forest mahogany, or red mahogany ; *E. rostrata*, Murray red gum, red gum, mahogany ; *E. tereticornis*, gray gum, Queensland blue gum, red gum, flooded gum, or bastard box ; *E. microcorys*, tallowwood ; and *E. viminalis*, manna gum.

Two years ago the term "commercial eucalyptus" was written in quotation marks ; now it is a common term, and thousands of acres have been devoted to seedling nurseries, and to timber production.

The commercial importance of the eucalyptus is implied in the title of an article in a recent magazine \* where it is ranked with the hickory. All the species produce hardwood, varying quite widely, however, in hardness. Originally the trees were regarded as suitable for forest cover, for windbreaks, for hedges, and for fuel. Now, there is no possible use to which wood may be put which is not claimed for one or more of the eucalypts which may be grown in a region where the wood supply has always been a distressing problem, and in a state where the beams used in the old mission churches were, it is said, carried hundreds of miles. The uses claimed by enthusiastic growers include fuel, fenceposts, corduroy roads (sixty years of service), paving blocks, railroad ties, bridge and mine timbers, telegraph and telephone poles, shipbuilding,† cooperage, furniture, house finishings and cabinet making. Handsomely finished rooms with highly polished "mahogany" furniture form part of the advertising methods of the larger eucalyptus and state-promotion organizations.

Extracting the antiseptic oil from the leaves and twigs is also profitable ; that and the keeping of bees where they can feed

\* Hickory's Younger Brother, by F. D. Cornell in the Sunset Magazine, March, 1909.

† "The wood is very dense, hard, close grained, and tough, and will bear a tremendous load or strain. Some species produce a wood so dense as to be practically impervious to water, and they are therefore almost proof against rot or decay, in water or out of it, in the earth or out of it ; and, owing to the oils and acids in the wood some species are proof against teredos, termites, insects, and borers."

on the eucalyptus blossoms, adds materially to the income ; but these are admitted to be secondary considerations. The shade value is not inconsiderable, and the forest cover it affords must render an enormous service to the whole Southwest. These last considerations do not appeal to the farmers and wood-growers any more forcibly than in the rest of the country, unfortunately ; and the " literature ", therefore, emphasizes the high financial profits to be gained within a few years, through the incredibly rapid growth of many of the species. Pamphlets published by the state forestry department and by private commercial corporations include the following statements : 1. " *E. globulus* trees 175 feet in height and 5 or 6 feet in diameter have been produced here (California) in from twenty-four to thirty years. The single quality, rapidity of growth, entitles the eucalypts to serious consideration, for no other species can attain like dimensions in five times this period." 2. " The average growth of a ten-year-old eucalyptus, based on exhaustive measurements, is given as eleven inches in diameter and ninety-two feet in height." 3. " Under favorable conditions trees in seedling plantations have reached a maximum development of 5 inches in diameter and 67 feet in height in four years. This represents an average of 17 feet height growth per year, though a growth of 10 to 15 feet in height yearly is the general average." 4. " In the height of the first growing season seedlings have frequently been observed to make an average height growth of 6 inches a day. The most rapid seedling growth noted was made by a tree which in nine years reached a height of 125 feet and a diameter of 36 inches." 5. The actual size of a tree from the forests of the Eucalyptus Timber Corporation, which was planted April 20, 1908, and dug up August 5, 1909, was " 13 ½ feet in height, measured on the bole, and 13 ¾ inches in circumference at the base ; the main tap-root had penetrated to an actual depth of 16 ½ feet below the surface of the soil." 6. " *E. globulus* eight to ten years old, if cut to the ground, will send up shoots that will reach a height of 75 or 100 feet, in from 6 to 8 years. The cutting may be repeated every few years for an indefinite period."

Californians are fond of quoting comparisons like the following

which is based upon tree measurements made in Kentucky by Mr. John B. Atkinson :

Pine oak	will grow to 12 in. diam. in 40 yrs.				
Black locust	"	"	12	"	40
Tulip	"	"	12	"	50
Black oak	"	"	12	"	50
Black walnut	"	"	12	"	56
Texas red oak	"	"	12	"	58
Sweet gum	"	"	12	"	62
Ash	"	"	12	"	72
Hickories	"	"	12	"	90
White oak	"	"	12	"	100
EUCALYPTUS	"	"	12	"	10

The above figures, which are probably somewhat biased, suggest however that in a short period the California wood famine will cease to be an important problem. It will not help materially the greater part of the United States, of course, as the eucalypts thrive best where the temperature does not fall below 24°.

Except that the entire genus is rather intolerant of cold, and therefore is confined to those sections of the globe where favorable climatic conditions obtain, there seems to be no limit to the fitness of the eucalypts to any given soil or climatic conditions. Some thrive in swamp land ; others in coastal situations or on high plateaus, hillsides, rocky lands, and even deserts. While the trees produce seeds freely, the seedlings do not " volunteer " ; and the production of seedlings for commercial purposes is confined to regularly established nurseries devoted to that purpose. The trees reproduce, however, very rapidly from shoots springing from the stump of felled trees, and the second growth is much more rapid and as valuable as the first growth.

Facts like the above indicate not only large financial profits in the near future (seven to ten years) with very little outlay, for these trees need very little care after the first two years ; but they also justify the optimistic claim that the " gap which is yawning between the supply which exists and the supply which will have to be provided " can be filled effectively — at least in the Southwest — if we but recognize the possible uses of the eucalypts, and that prompt action in planting quantities of the more desirable eucalypts will postpone indefinitely the " lean years " close upon us.